CLAIMS

1. An isolated nucleic acid sequence that can be obtained from the HXHV virus genome, said nucleic acid sequence comprising the sequence SEQ ID No. 4 of the sequence complementary to SEQ ID No. 4.

2. An isolated nucleic acid sequence that can be obtained from the HXHV virus genome, said nucleic acid sequence consisting of the sequence SEQ ID No. 4 or of the sequence complementary to SEQ ID No. 4.

3. A DNA nucleotide fragment, characterized in that it comprises or consists of a nucleotide sequence of at least 12 contiguous nucleotides belonging to SEQ ID No. 4 or to the sequence complementary thereto.

4. The fragment as claimed in claim 3, characterized in that it comprises or consists of a sequence of at least 15 contiguous nucleotides belonging to SEQ ID No. 4 or to a sequence complementary thereto.

5. The fragment as claimed in claim 3 or 4, characterized in that it comprises or consists of a sequence of at least 18 contiguous nucleotides belonging to SEQ ID No. 4 or to the sequence complementary thereto.

6. The fragment as claimed in any one of claims 3 to 5, characterized in that it comprises or consists of a sequence of at least 20, 21, 22, 23, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51 or 54 contiguous nucleotides belonging to SEQ ID No. 4 or to the sequence complementary thereto.

7. A DNA nucleotide fragment, characterized in that it comprises or consists of a nucleotide sequence which, over at least 12 contiguous nucleotides, exhibits at least 90% identity, preferably at least 95% identity, and advantageously at least 98% or 99% identity, with SEQ ID No. 4 or with the sequence complementary to SEQ ID No. 4, with the exclusion of the sequences TAGTCGAGACTCAACCATCGC and CCCGCCCCGCTGATGAAAAG and of the nucleotide sequences complementary to said sequences.

8. A DNA nucleotide fragment, characterized in that it comprises or consists of a nucleotide sequence which, over at least 15 contiguous nucleotides, exhibits at least 90% identity, preferably at least 95% identity, and advantageously at least 98% or 99% identity, with SEQ ID No. 4 or with the sequence complementary to SEQ ID No. 4, with the exclusion of the sequences TAGTCGAGACTCAACCATCGC and CCCGCCCCGCTGATGAAAAG and of the nucleotide sequences complementary to said sequences.

9. A DNA nucleotide fragment, characterized in that it comprises or consists of a nucleotide sequence which, over at least 18 contiguous nucleotides, exhibits at least 90% identity, preferably at least 95% identity, and advantageously at least 98% or 99% identity, with SEQ ID No. 4 or with the sequence complementary to SEQ ID No. 4, with the exclusion of the sequences TAGTCGAGACTCAACCATCGC and CCCGCCCCGCTGATGAAAAG and of the nucleotide sequences complementary to said sequences.

10. A DNA nucleotide fragment, characterized in that it comprises or consists of a nucleotide sequence which, over at least 20, 21, 22, 23, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51 or 54 contiguous

nucleotides, exhibits at least 90% identity, preferably at least 95% identity, and advantageously at least 98% or 99% identity, with SEQ ID No. 4 or with the sequence complementary to SEQ ID No. 4, with the exclusion of the sequences TAGTCGAGACTCAACCATCGC and CCCGCCCCGCTGATGAAAAG and of the nucleotide sequences complementary to said sequences.

11. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 2 and ending at nucleotide 286 of SEQ ID No. 4, or a fragment complementary to said fragment.

12. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 4 and ending at nucleotide 144 of SEQ ID No. 4, or a fragment complementary to said fragment.

13. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 180 and ending at nucleotide 1004 of SEQ ID No. 4, or a fragment complementary to said fragment.

14. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 614 and ending at nucleotide 820 of SEQ ID No. 4, or a fragment complementary to said fragment.

15. The fragment as claimed in any one of claims 3 to

10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 1228 and ending at nucleotide 1314 of SEQ ID No. 4, or a fragment complementary to said fragment.

16. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 1283 and ending at nucleotide 1197 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

17. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 1264 and ending at nucleotide 1067 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

18. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 1209 and ending at nucleotide 1099 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

19. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 819 and ending at nucleotide 736 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

20. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 800 and ending at nucleotide 6 of the

sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

21. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 784 and ending at nucleotide 629 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

22. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 610 and ending at nucleotide 410 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

23. The fragment as claimed in any one of claims 3 to 10, characterized in that said contiguous nucleotides belong to the segment beginning at nucleotide 391 and ending at nucleotide 221 of the sequence complementary to SEQ ID No. 4, or a fragment complementary to said fragment.

24. The fragment as claimed in any one of claims 3 to 6, characterized in that it comprises or consists of any one of the sequences SEQ ID Nos. 5 to 17 or any one of the sequences complementary to sequences SEQ ID Nos. 5 to 17.

25. A product of transcription of a sequence as defined in either one of claims 1 and 2 or of a fragment as defined in any one of claims 3 to 24.

26. A DNA molecule, characterized in that it comprises or consists of a sequence as defined in either one of claims 1 and 2 or a fragment as defined in any one of claims 3 to 24.

27. An RNA molecule, characterized in that it comprises or consists of a product of transcription of a DNA molecule as defined in claim 26.

28. A polypeptide whose polypeptide sequence is encoded by a sequence as defined in either one of claims 1 and 2 or by a fragment as defined in any one of claims 3 to 24.

29. The polypeptide as claimed in claim 28, whose polypeptide sequence comprises or consists of any one of the sequences SEQ ID Nos. 18 to 30 or of a polypeptide sequence equivalent to any one of the sequences SEQ ID Nos. 18 to 30, in which (i) the amino acids alanine, proline and glycine are equivalents, (ii) the amino acids aspartic acid and glutamic acid are equivalents, (iii) the amino acids histidine, lysine and arginine are equivalents, (iv) the amino acids asparagine, glutamine, serine and threonine are equivalents, (v) the amino acids phenylalanine, tyrosine and tryptophan are equivalents, and (vi) the amino acids isoleucine, leucine, valine and methionine are equivalents.

30. The polypeptide fragment as claimed in claim 28, comprising or consisting of a peptide sequence of at least 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 or amino acids belonging to any one of the sequences SEQ ID Nos. 18 to 30 or to a sequence equivalent to any one of the sequences SEQ ID Nos. 18 to 30, in which (i) the amino acids alanine, proline and glycine are equivalents, (ii) the amino acids aspartic acid and glutamic acid are equivalents, (iii) the amino acids histidine, lysine and arginine are equivalents, (iv) the

amino acids asparagine, glutamine, serine and threonine are equivalents, (v) the amino acids phenylalanine, tyrosine and tryptophan are equivalents, and (vi) the amino acids isoleucine, leucine, valine and methionine are equivalents.

31. An epitope, characterized in that it comprises or consists of a peptide sequence of at least 6, 8, 9, 10, 12, 15 or 18 amino acids, and at most of 10, 12, 15 or 18 amino acids, in particular in that its sequence consists of a peptide sequence of 6 to 10 amino acids, of 6 to 12 amino acids, of 6 to 15 amino acids, of 6 to 18 amino acids, of 8 to 10 amino acids, of 8 to 12 amino acids, of 8 to 15 amino acids, of 8 to 18 amino acids and of 15 to 18 amino acids, of any one of the sequences represented in SEQ ID Nos. 18 to 30 or of a polypeptide sequence functionally equivalent to said sequences SEQ ID Nos. 18 to 30.

32. An expression cassette that is functional in a cell derived from a prokaryotic or eukaryotic organism, allowing the expression of a nucleic acid sequence as claimed in either one of claims 1 and 2 or of a fragment as claimed in any one of claims 3 to 24 or of a DNA molecule as claimed in claim 26, placed under the control of the elements required for its expression.

33. A vector comprising an expression cassette as claimed in claim 32.

34. A cell derived from a eukaryotic or prokaryotic organism comprising an expression cassette as claimed in claim 32 or an expression vector as claimed in claim 33.

35. The cell as claimed in claim 34, characterized in

that it is derived from a eukaryotic organism, in particular cells originating from animals such as mammals, reptiles or insects, preferably cells chosen from COS, CHO, Vero, BHK, PK 15 and RK 13 cells; human osteosarcoma cell lines, HeLa human cell lines and human hepatoma cell lines; insect cell lines.

36. The cell as claimed in claim 34, characterized in that it is derived from a lower eukaryotic organism, in particular derived from yeast such as *Saccharomyces, Schizosaccharomyces, Kluveromyces, Hanseluna, Yarowia, Schwaniomyces, Zygosaccharomyces* and *Pichia*, and preferably chosen from *Saccharomyces cerevisiae, Saccharomyces carlsbergensis, Schizosaccharomyces pombe, Kluveromyces lactis* and *Pichia pastoris* cells.

37. The cell as claimed in claim 34, characterized in that it is derived from a prokaryotic organism, preferably *E. coli*.

38. A polypeptide that can be produced by an expression cassette as claimed in claim 32, a vector as claimed in claim 33 or a cell as claimed in any one of claims 34 to 37.

39. A method for preparing a polypeptide as claimed in claim 28 or 29 or a peptide fragment as claimed in claim 30, according to which a host cell as defined in any one of claims 34 to 37 is cultured in an appropriate culture medium, and said polypeptide or said peptide fragment produced is purified, to a required degree of purity.

40. An immunogenic polypeptide, comprising or consisting of a polypeptide as defined in claim 28

or 29 or a peptide fragment as defined in claim 30.

41. A monoclonal or polyclonal antibody that can be obtained by immunization of a mammalian animal with an immunogenic polypeptide as defined in claim 40.

42. A diagnostic composition, characterized in that it comprises a polypeptide as defined in claim 28 or 29 or a polypeptide fragment as defined in claim 30.

43. A diagnostic composition, characterized in that it comprises a monoclonal antibody or a polyclonal antibody as defined in claim 41.

44. A method for detecting antibodies directed against the HXHV virus or at least a polypeptide as defined in claim 28 or 29 or a peptide fragment as defined in claim 30, according to which a biological sample from a patient suspected of being infected with HXHV virus is brought into contact with a diagnostic composition as defined in claim 42, under predetermined conditions which allow the formation of antibody/antigen complexes, and the formation of said complexes is detected.

45. A method for detecting a polypeptide as defined in claim 28 or 29 or a peptide fragment as defined in claim 30, in a biological sample from a patient suspected of being infected with the HXHV virus, according to which the biological sample is brought into contact with a diagnostic composition as claimed in claim 43, under predetermined conditions which allow the formation of antibody/antigen complexes, and the formation of said complexes is detected.

46. An immunogenic or vaccine composition, characterized in that it comprises a polypeptide as defined in claim 28 or 29 or a peptide fragment as defined in claim 30, combined with an appropriate vehicle and/or adjuvant and/or diluent and/or with a pharmaceutically acceptable excipient.

47. A probe of at least 12 nucleotides, characterized in that it is capable of hybridizing to a nucleic acid sequence as defined in claim 1 or 2, or to a nucleotide fragment as defined in any one of claims 3 to 24, or to a DNA or RNA molecule as defined in claim 26 or 27, the hybridization being carried out under given stringency conditions.

48. A primer of at least 12 nucleotides, characterized in that it is capable of hybridizing to a nucleic acid sequence as defined in claim 1 or 2, or to a nucleotide fragment as defined in any one of claims 3 to 24, or to a DNA or RNA molecule as defined in claim 26 or 27, the hybridization being carried out under given stringency conditions.

49. The primer as claimed in claim 48, characterized in that it is chosen from the primers SEQ ID Nos. 32 to 37.

50. A pair of primers as claimed in claim 48, characterized in that it is chosen from one of the following pairs: SEQ ID No. 31/SEQ ID No. 32, SEQ ID No. 31/SEQ ID No. 33, SEQ ID No. 34/SEQ ID No. 35, and SEQ ID No. 36/SEQ ID No. 37.

51. An anti-nucleic acid antibody, characterized in that it is capable of binding to a nucleic acid sequence as defined in claim 1 or 2, or to a

nucleotide fragment as defined in any one of claims 3 to 24 or to a DNA or RNA molecule as defined in claim 26 or 27.

52. A diagnostic composition, characterized in that it comprises at least one probe or at least one primer or at least one pair of primers or one anti-nucleic acid antibody as defined in claims 47, 48, 49, 50 or 51.

53. A method for detecting a viral DNA or RNA, in a biological sample from a patient suspected of being infected with the HXHV virus, according to which said sample is, if necessary, treated so as to extract the DNA or the RNA therefrom, said DNA or RNA is brought into contact with at least one probe or with at least one primer or with at least one pair of primers as defined in claims 47, 48, 49 or 50, under given stringency conditions, and the presence of viral DNA or RNA in the sample is detected either by demonstrating hybridization of said viral DNA or RNA with at least one probe as defined in claim 47, or by amplifying said DNA or RNA using at least one primer as defined in claim 48 or 49 or at least one pair of primers as defined in claim 50.

54. A method for detecting viral DNA and/or RNA of the HXHV virus, according to which a biological sample such as serum, plasma or blood is taken from a patient, said sample is, if necessary, treated so as to extract the DNA and/or the RNA therefrom, said sample is brought into contact with at least one anti-nucleic acid antibody as defined in claim 51, said antibody being optionally labeled with any appropriate label, and the formation of a nucleic acid/antibody complex is demonstrated.

55. A vaccine composition comprising a DNA sequence encoding at least one polypeptide as defined in claim 28 or 29 or encoding at least one peptide fragment as defined in claim 30, said DNA being mixed with a pharmaceutically acceptable vehicle and/or diluent and/or excipient.

56. A vector comprising at least one gene of therapeutic or vaccine interest, said gene encoding in particular at least one polypeptide or peptide fragment as defined in any one of claims 28, 29 and 30.

57. A therapeutic or vaccine composition, characterized in that it comprises a vector as defined in claim 56 and in that said gene of interest is placed under the control of elements that ensure its expression *in vivo*.

58. A genetically modified cell, in particular chosen from eukaryotic cells, such as COS, CHO, Vero, BHK, PK 15 and RK 13 cells; human osteosarcoma cell lines, HeLa human cell lines and human hepatoma cell lines, insect cell lines; cells of lower eukaryotes, such as yeast cells, in particular cells derived from *Saccharomyces, Schizosaccharomyces, Kluveromyces, Hanseluna, Yarowia, Schwaniomyces, Zygosaccharomyces* and *Pichia*, and preferably chosen from *Saccharomyces cerevisiae, Saccharomyces carlsbergensis, Schizosaccharomyces pombe, Kluveromyces lactis* and *Pichia pastoris* cells; prokaryotic cells, such as those derived from *E. coli*; said cells being transformed with at least one nucleic acid sequence as claimed in claim 1 or 2 or with at least one nucleotide fragment as claimed in any one of claims 3 to 24 or with a DNA molecule as claimed in claim 26 or with a vector as claimed in

claim 56.

59. A pharmaceutical or vaccine composition, characterized in that it comprises a cell as claimed in claim 58.